Workplace Change and Employee Mental Health: Results from a Longitudinal Study

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SUMMARY

This study is intended to improve understanding of the impact of workplace change on employee mental health and wellbeing. We construct and test a comprehensive measure of organisational change, which is then applied in a prospective longitudinal study of nearly 5400 employees in six UK National Health Service Trusts. Self-rated mental health was assessed using the 12- item version of the General Health Questionnaire. Just under a quarter of the sample were at increased risk of psychiatric morbidity ('cases'). After controlling for a wide range of personal characteristics and work variables, it was found that respondents who reported an increase in the amount of work over the previous year were more likely to be classed as GHQ cases, whereas increased training and promotion and improved job security had a beneficial effect on employee mental health (less likelihood of being GHQ cases). Quantity or degree of change showed a somewhat ambiguous relationship with GHQ status. Our findings challenge the assumption that change will necessarily have an adverse effect on health, indicating areas, such as promotion and development, where a positive impact might be anticipated.

KEYWORDS: workplace change, employees, mental health, well-being, National Health Service; longitudinal.

INTRODUCTION

Workplace change and its effective management are pervasive themes in contemporary management literature. Change and its outcomes can be considered at various levels, including individual, group, organisational and social (Huczynski and Buchanan, 2007). It would appear, however, that individual-level change receives much less attention than change at other levels (Wanberg and Banas, 2000, p.132; Wilson, 2004, p. 282). In particular, the effects of change on employee health and wellbeing remain under-researched (Ferrie et. al., 1998, p. 244).

It is recognised that individuals are affected by, and in turn can affect, organisational change (Wilson, 2004). Apart from the concerns that change has negative effects on wellbeing (Tehrani et. al., 2007, p.3) and can therefore contribute to workplace 'stress' and its associated costs, the salience of employees' psychological health in respect of change is twofold: poor mental health may impede success and act as a barrier to future change (McHugh and Brennan, 1994, p. 30); and improving mental health might be regarded as a measure of success of change, one which would complement more traditional measures, such as user satisfaction or system usage (Jones et. al., 2005).

Attempts to investigate the effects of change on employee mental health have been limited in several respects. A lack of standard measures or of a unified theoretical perspective on workplace/organisational change has led to limitations in understanding individual-level change. The minority of studies which have considered the effects of change on individuals have not reached clear conclusions. Many are cross-sectional and therefore can say very little about causal processes.

There has only been limited consideration of the ways that work and non-work variables may interact to influence the effects of change on individuals (Smith, 2001, p. 82).

This article aims to address these empirical and theoretical gaps via a longitudinal study of staff in the UK National Health Service (NHS). Following a brief review of research on workplace change and health, we outline the aims and design of our study, before discussing the development of measures of change. The paper proceeds by analysing the effects of workplace change on mental health, and concludes by considering some managerial, policy-related and theoretical implications of the findings.

CHANGE AND HEALTH

An extensive body of research suggests that a sizeable and increasing proportion of the population suffers from work-related stress (e.g. Edwards and Burnard, 2003; Smith et. al., 2000). Concern is expressed over the negative consequences of stress for individuals' psychological wellbeing (World Health Organisation, 2001), organisational performance and efficiency (Jones et. al., 2003) and financial costs imposed on the economy (European Foundation, 2001).

Although it is accepted that change in organisations and work is linked with stress, existing research provides a somewhat unclear picture of the effects of change on employees' mental health. First there is the issue of defining change. As Szamosi and Duxbury (2002, p.186) note, a lack of rigour with respect to terminology has led to

confusion and inconsistency in this area. In particular, 'organisational' change has been used both to indicate change affecting an entire organisation and as an all-encompassing term for workplace change, from the 'strategic' to the micro-level or instrumental (Nadler and Tushman, 1990).

Management and health research, from a broad range of countries and industrial sectors, has focused on the impact of high-level changes, such as mergers (Kavanagh and Ashkanasy, 2006), restructuring (Hansson et. al., 2008, Bourbonnais et. al., 2005, Wanberg and Banas, 2000; Litwenko and Cooper, 1997), downsizing (Dragano et. al., 2005; Theorell et. al., 2003), and changes associated with these, e.g. job insecurity (Naswall et. al., 2005) and contractual transfer (Ferrie et. al., 1998). It is posited that these *types* of change can have negative consequences for health and wellbeing.

However, considering change solely at the level of the organisation is unsatisfactory: there is an assumption that all employees will experience organisational change in a similar way. For example, Dragano et. al. (2005), who found that 'survivors' of organisational downsizing were more likely to experience poor mental health, assumed this was because all survivors experienced work intensification. On the other hand, a systematic review (Platt et. al, 1998), covering European literature (1993-1998) related to all industries, found that downsizing may have a positive effect on mental health by leading to clearer roles and responsibilities for employees and increasing worker participation. More recently, Desombre et. al. (2006) have demonstrated that increasing functional flexibility can improve wellbeing by offering variety and challenge, but may also lead to work intensification which has links with poorer psychological health.

We argue that employees' experience of organisational change may be highly variable. Taking restructuring as an example, for some this may mean job loss, relocation or a change to their contract; while for others it may afford opportunities for promotion and taking on new tasks and responsibilities; and some may even experience little or no change to their ways of working. While this would seem an obvious point to make, it is acknowledged (Rafferty and Griffin, 2006) that it is a neglected aspect of studying change.

In addition to the *type* of change experienced by employees, it is also necessary to consider the *amount* of change. There is evidence that continued exposure to change may impair wellbeing (Buchanan et. al., 1999; Ferrie et. al., 2002), and that more frequent change has negative effects (Rafferty and Griffin, 2006). Thus, both the quantity and rate of change may lead to change fatigue and to poorer mental health (Eriksson, 2004).

Our literature review uncovered only a handful of studies, many with problematic research designs, that have attempted to examine the changes experienced by individuals as a result of organisational change. Key limitations have arisen because studies are cross-sectional (Swanson and Power, 2001) or have considered restricted dimensions of change. For example, Rafferty and Griffin (2006) focused only on quantity of change, and Vaananen et. al. (2004) measured change solely through employees' perceptions of whether or not their standing at work had changed during the period of a merger.

Moreover, studies have differed in terms of the range of included variables which may moderate or mediate the impact of change on employee health. Evidence from Platt et. al.'s review (1998) suggests that: work change impacts differentially on the health of employees at different levels; perceived co-worker support and accurate information about impending change sometimes reduce adverse health impacts; personality characteristics, such as positive and negative affectivity and self-esteem, are important in either heightening or reducing the health impact of some types of change (see also Naswall et. al., 2005); and workplace change which results in higher perceived decision latitude and skill discretion has a positive health impact.

We lack research specifically designed to examine the relationships between workplace change – in all its forms, from strategic to incremental – and employee mental health, which takes account of the potential moderating and mediating effects of a range of work and non-work factors.

In view of these gaps, we aimed to construct a comprehensive and inclusive model to investigate the effects of workplace change on the mental health of employees. Theoretically, the two models "most influential in the study of [workplace] health" (Pikhart et. al., 2004 p.1476) are the Demand-Control-Support (DCS) model (Karesek, 1979; Karasek and Theorell, 1990) and the Effort-Reward Imbalance (ERI) model (Siegrist, 1996). An excellent overview of each model can be found in De Jonge et. al. (2000). Briefly, both focus on psychosocial work factors. The DCS model recognises that it is the relationship between the perceived demands of the job, the control over the job and the instrumental and social support provided by peers and managers which influences job strain (itself associated with depression, psychological

distress and burnout). It is thus focused on the task characteristics of the job. The ERI model is broader, including aspects of structural (e.g. perceptions of job security, mobility and salaries) and personal components of stress. Previous research has advocated combining elements of the two models and incorporating specific objective characteristics of the work environment (Calnan et. al., 2000; Godin and Kittel, 2004). Our approach was to use an expanded version of the DCS model, complemented by a range of structural, personal, objective work and non-work variables, as advocated by other researchers in the field.

We chose the NHS for several reasons. First, there is widespread evidence that stress and negative effects of stress are particularly prevalent amongst health care professionals (e.g. Edwards and Burnard, 2003 ; HSE, 2005; Smith, 2001). Second, the NHS is the largest single employer in the UK, with employees drawn from the full spectrum of socio-economic groups. Third, the NHS has experienced significant management reforms in last decade or so (Bach, 2004), and is associated with a climate of 'permanent' (Litwinenko and Cooper, 1997) or 'ongoing' (Desombre et. al., 2006) change. More broadly, it features prominently in any considerations of organisational change within public sector organisations, both in the UK and internationally (Ferlie et. al., 2003).

Given the emphasis on change within the NHS, it is surprising that the effects of change on its employees have received so little attention. A comprehensive review of organisational change within the NHS (Iles and Sutherland, 2001) reveals only a handful of studies which considered effectiveness of change from the perspective of employees, and none of these directly addressed health. Our own review of the

literature revealed few studies. In the UK, Litwinenko and Cooper's (1997) assessment on the impact of hospital restructuring on health care staff revealed little impact on job satisfaction and job security. Their analysis was limited in terms of consideration of change and in not controlling for other significant moderators. Another study, which aimed to investigate the links between organisational change and NHS employees' decisions to leave their jobs (Morrell et. al., 2004), focused on 'shocks' – the role of a single, jarring event – in prompting decisions to quit. The research did not consider employees' personal circumstances, nor was there direct evidence that shocks occurred as a result of change. A mainly qualitative study of midwives (Prowse and Prowse, 2008) highlighted the negative consequences of role redesign for the profession but did not consider potential health impacts.

Other studies, mostly outside the UK, have been conceptually more sophisticated, either in their theoretical foundations (e.g. Bourbonnais et. al., 2005; Calnan et. al., 2000) or in their treatment of change (Hansson et. al., 2008; Brown et. al., 2006). However, these have typically focused only on one occupational group (nurses, general practitioners) and have considered only a selection of personal and other work variables.

AIMS AND METHODOLOGY

Aims and study design

The aims of the study were twofold: to construct and test a comprehensive measure of workplace change, suitable for use with employees of the NHS; and to use the measure to explore the effects of workplace change on employee mental health.

The study was based on a survey using postal self-report questionnaires, administered on three occasions (baseline, 12 months and 24 months) to cohorts of staff, selected by means of stratified, random sampling, in six NHS Trusts. This was supplemented by a qualitative investigation of employees' perceptions of the pathways between change and health in one Trust over the three years of the study, using a combination of in-depth interviewing, observation and documentary analysis. The survey elicited data from nearly 5 400 individuals across the six trusts, while the qualitative study involved 48 staff (of whom 41 were interviewed again in year two and 37 in year three). We also interviewed key representatives of management (Chief Executive, Medical Director, Human Resources Director, Nursing Director) and staff (Royal College of Nursing and UNISON representatives) in each Trust in each of the three years. The purpose of these interviews was to develop an overview of change at Trust (organisation) level, and to provide some context for individuals' responses. This article draws mainly on the survey data, supported by the qualitative interviews, as appropriate.

All UK University Teaching Trusts outside London (N=20) were invited to participate. We did not include London Trusts because of the particular staffing problems they were facing at the time of the study. Six Trusts, two in Scotland and four in England, opted into the study. The collaborating hospitals supplied us with estimated head counts for each staff group. In recognition of the different sizes of population subgroups and the problems of attracting the participation of lower status occupational groups, such as ancillary workers, varied sampling fractions were applied across staff groups.

Ethical approval for the study was sought from and granted by the Multi-Centre Research Ethics Committee (MREC) for Scotland. Approval covered all Trusts participating in the study.

Measuring organisational change

On the basis of our literature review, we were confident that there was no existing instrument to capture types/elements and amount of workplace change. The managerial questionnaire in the nationally-representative Workplace Employment Relations Survey (WERS) series (Cully et. al., 1999) provided a starting point, identifying the following types of change:

- Changes in ownership/control
- Company reorganisation/restructuring
- Managerial changes
- Changes in type, use and conditions of employees
- Changes in consultation
- Change in influence of trade unions
- Customer pressure
- Quality issues
- Change in market conditions/competitive situation
- Change in legislation/government policy
- Introduction of new technology.

We elaborated on these using NHS-specific change issues identified by Upton and Brooks (1995). Moreover, as we wished to avoid the criticism that studies of (human resource) management are too often management-centric (Boselie et. al., 2005), we consulted staff extensively through our comprehensive pre-pilot and pilot studies (Loretto et. al., 2001). The resulting types of change divided naturally into two categories: those requiring a simple yes/no response (eg basis of contract changed), and those which could vary in a number of ways (eg amount of training received). Two main measures of types of change were constructed (see Appendix). Exploratory principal components analysis was conducted on the scaled items of change. Four clear factors emerged (see Table 1), related to training and development, work content, peer contact and patient contact. Job security did not load onto any factors and was therefore treated as a stand-alone variable. These factors and

the job security variable were used in subsequent analysis of organisational change. The factor scores ranged from 1 to 5, with a higher score indicating greater increase.

* Table 1 about here*

The amount of change was measured in two ways. First, an additive scale was constructed from the binary response change items. Second, a measure of the perceived extent of change was adapted from WERS. The responses ranged from 'none at all' (scored 1), through 'a little' (2), 'moderate' (3), 'quite a lot' (4) to 'a great deal' (5). Additional questions on channels and effectiveness of communication of change were adapted from WERS. Involving employees in decision-making has been an important aspect of NHS employment rhetoric for the past decade, from empowerment (Cunningham and Hyman, 1996) in the 1990s to the current emphasis on partnership (Bach, 2004).

Other questions

The questionnaire also aimed to measure a wide range of non-work and work-related factors. Following our theoretical approach, we included questions to capture the perceptions of control, demands and support (from peers and managers) central to Karsek's model. Based on our review of previous research we aimed to incorporate the widest possible range of personal, demographic and lifestyle variables.

All factors measured in the study have previously been shown to affect psychological health and wellbeing (Cunningham et. al., 2004; Jenkins et. al, 2003; Stansfeld et. al., 2002) or may moderate the effects of organisational change on health (Platt et. al.,

1998, Naswall et. al., 2005, Tennant, 2001). Certain personality traits, such as self-efficacy, have also been linked to readiness for, and receptiveness to, change (Cunningham et. al., 2002). The non-work factors included: socio-demographics (age, gender, marital status, dependent children); personal traits (neuroticism and extroversion (Eysenck, 1960)); self efficacy (Schwartzer, 1993) and self-esteem (Rosenberg, 1962)); measures of socio-economic status (educational qualifications, income, housing tenure, car ownership); measures of perceived social support from family, friends and religion; and health-related behaviours (smoking and alcohol consumption). We also included a measure of 'mixed' life events (adapted from Paykel et. al., 1971). The work-related factors included objective (e.g. contract basis, length of service, place of work, job title, grade, hours and patterns of work, union membership, extent of teamworking) and perceived facets (Haynes et. al., 1999) of the workplace, as well as extent of work-life balance (WLB). Our measure of WLB, which was developed for the study (Loretto et. al., 2005), was based upon the Work-Home Interference (WHI) scale (Guerts et al., 1999).

Self-rated mental health was measured using the 12-item version of the General Health Questionnaire (GHQ), "a well validated self-administered screening test, designed to identify short-term changes in mental health (depression, anxiety, social dysfunction and somatic symptoms)" (Goldberg, 1972;1978). It has been widely used in studies of employee wellbeing (e.g. Bardasi and Francesconi, 2004; Burbeck et. al., 2002; Naswall et al 2005; Wall et. al., 1997; Weinberg and Creed, 2000). Respondents are asked to indicate recent (positive and negative) deviations from their normal state of concentration, worry, coping with everyday life and feelings about themselves. For each item a stable state or positive deviation receives a nil-score,

whereas a negative deviation is assigned a score of 1. The scale range is 0-12. Those who score above a certain threshold (typically 2, 3 or 4) are termed 'cases' and are thought to be at increased risk of psychiatric morbidity (although psychiatric assessment is needed for clinical diagnosis). We chose the more conservative cut-off point of a score of 4+ because this minimises the risk of generating 'false negatives', i.e. classifying as a case someone who is not likely to have elevated psychiatric morbidity (e.g. Weinberg and Creed, 2000).

Validity and reliability of measures

The reliability and validity of many measures used in the study were already well established. The internal consistency coefficients of scales measuring perceived demands, control and support (Cronbach's alpha = 0.90 – 0.93) compared favourably to those found in other studies involving NHS staff (e.g. Haynes et. al., 1999). Face validity of our measures of change are considered to be high as most of our items were drawn from established measures (WERS). Construct validity of the change scale was confirmed using factor analysis (Table 1) and through evidence of expected associations between change and outcome (health) variables. Both the factors and the associations had initially been identified in the piloting process.

Response rate

The initial baseline survey conducted in 2001 yielded a disappointing response. After extensive investigations, it was concluded that the procedures stipulated by MREC had discouraged people from participating in the study. Further details of the issues involved can be obtained from the authors. In brief, one of the key discouraging influences arose from MREC's requirement that we sought participants' agreement to

opt into the study *before* they received a copy of the survey instrument. To raise the response rate we sought permission from the funders to conduct a further round of recruitment in 2002, and MREC agreed to let us issue the questionnaire together with the opt-in form. We sampled fully those staff groups with the poorest response rates (ancillary, maintenance, A-C grade nurses) and a 50% sample of other staff groups was taken. The cohort recruited in 2001 received their first follow-up survey in 2002. We decided to combine the responses from the two cohorts in 2002 to constitute the new study baseline. Any differences in the composition (e.g. in terms of staff group) between the two cohorts have been controlled for in our analyses.

Adjusting the raw response rates for undeliverable and undelivered questionnaires, the final estimate of the baseline response was 18.4%. We could not boost the responses by sending reminder letters. In order to comply with stringent requirements to protect participant confidentiality introduced by the Data Protection Act 1998, the sampling and distribution of the questionnaires had to be undertaken by the Trusts. Thus, we had no way of excluding from any reminders those who had already responded. We also considered that sending out reminders would have placed an unacceptable additional burden on the time and resources of the Trusts. Set against this low baseline response, there was a very encouraging retention rate: 84.3% of the original cohort over the three waves of the survey, and 76.7% of the second cohort. This low level of attrition compares favourably with other studies of health-care workers, both in the UK (Litwinenko and Cooper 1997) and in Canada (Woodward et al 1999).

Details of sample

Although we followed up all respondents, including those who left the NHS during the course of the study, we focus here only on respondents working for one of the study Trusts in both 2002 and 2003. As can be seen from Table 2, some two-fifths of our sample was composed of qualified nursing staff, and about four-fifths were female. The age of our respondents ranged from 17 to 70 years, with a mean age of 41.0 years (s.d. = 10.0).

* Table 2 about here*

Comparison of our sample with that recruited to the 2004 NHS National Staff Survey (Commission for Healthcare Audit and Inspection, 2005, English Trusts only) shows almost identical proportions of respondents in the various staff groups in the Trusts common to both studies, thereby allowing some confidence in the representativeness of the achieved sample and the generalisability of our findings.

FINDINGS

Employee wellbeing: GHQ caseness

The overall proportion of respondents classed as GHQ cases altered little between 2002 (24.2%) and 2003 (24.7%). This stability masks change for individuals: 13.3% of the sample were non-cases in 2002 but recorded case scores in 2003, whereas 12.5% of employees made the move in the opposite direction – from cases in 2002 to non-cases in 2003. The proportion of respondents considered to be cases is in line with other NHS studies. Wall et. al. (1997) found a GHQ case rate of 26.8%, in their survey of employees from 19 Trusts in England and Wales. The prevalence of cases in the NHS samples is considerably higher than that found in the general working-age population. Data from the British Household Panel Survey (2000) indicate a case rate of 18.4% (authors' own analysis). This suggests that health service staff exhibit a higher propensity towards minor psychiatric illness than do employees in other sectors.

Change

(i) Changes at Trust level

Replies from the management and staff-side interviews indicated that change was typically perceived to be 'substantial' or 'massive' in each of the six Trusts. One was undergoing relocation of its principal hospital, while others were concerned with applying for Trust foundation status. Agenda for Change (http://www.dh.gov.uk/PolicyAndGuidance/HumanResourcesAndTraining/ModernisingPay/AgendaForChange/fs/en) was a dominant driver of change to pay systems and work organisation to varying extents across all Trusts. Rationalisations and reviews of

service delivery were highlighted in three of the Trusts. Flexible working, in particular moves to extend and formalise arrangements were of concern to all but one Trust. All Trusts were undergoing information technology related change, overhauling outdated systems. The other predominant changes related to working arrangements, driven by the new working hours for junior doctors, in compliance with amendments to the Working Time Regulations (http://www.dh.gov.uk/PolicyAndGuidance/HumanResourcesAndTraining/ModernisingPay/JuniorDoctorContracts/fs/en).

(ii) Individuals' experiences: types of change

As mentioned earlier, the survey measured individual employees' experience of change in two ways. The first measure was based on the change factors identified in Table 1. Work content increased over time (two-tailed t-test showed significant difference from 'stayed the same'; $t=80.85$, $p<0.00$), while mean scores for peer contact, training and development, patient contact and job security remained stable (i.e. did not differ significantly from 'stayed the same'). There were significant associations between non-case status and training and development (mean for non-GHQ case = 3.12 (s.d.= 0.71); mean for GHQ case = 2.79 (s.d. = 0.80)), patient contact (mean for non-GHQ case = 3.02 (s.d. = 0.77); mean for GHQ case = 2.86 (s.d. = 0.84)) and job security (mean for non-GHQ case = 2.99 (s.d. = 0.58); mean for GHQ case = 2.82 (s.d. = 0.73)), whereas higher work content was significantly associated with GHQ caseness (mean for GHQ case = 3.93 (s.d. = 0.71); mean for non-GHQ case = 3.80 (s.d. = 0.67)). There was no significant association between peer contact and GHQ scores.

The second measure consisted of the list of 23 items with a binary response (Appendix, Q2). The most commonly experienced changes were: working with different colleagues (n=1532; 34.8%); changing quality of physical surroundings (n=1276; 29.0%); changing line manager/supervisor (n=1234; 28.0%); expansion of unit/department (n=1054; 23.9%); and changing access to equipment (n=933; 21.2%).

* Table 3 about here*

Possible associations between each different type of change and GHQ status in 2003 were explored through chi-squared analysis. Overall, ten changes showed a significant association ($p<0.05$), and these are shown in Table 3. Most of these demonstrated a negative relationship with GHQ. Thus, for example, the percentage of respondents reporting a change in the quality of their physical surroundings was higher among cases (33.1%) than among non-cases (27.7%) ($p<0.00$). Significant differences were also found in relation to experience of reorganisation of unit or department (22.7% vs. 16.2%; $p<0.00$), having been instructed to move work location (17.5 vs. 12.5%; $p=0.00$) or to change their shifts/days of work (7.7% vs. 4.7%; $p<0.00$). Positive effects were seen in connection with those respondents who chose to move work location (12.3% of cases reported this change vs. 15% of non-cases; $p<0.03$) and those who successfully applied for promotion (10.7% vs. 13.6%; $p<0.01$).

(iii) Individuals' experiences: amount of change

The mean number of changes experienced was 2.63 (range = 0-23; s.d. = 2.33). As regards the measure of perceived amount of change, 6.6% of respondents said they had no experience of change over the past year; 30.3% said they had experienced

'little' change over the year, 25.0% felt they had experienced a 'moderate' amount of change, 21.6% 'quite a lot' and 16.6% 'a great deal'. There was a moderately strong positive association between the reported number of changes and the perception of the amount of change ($r=0.552$; $p<0.00$). Both measures showed statistically significant relationships with GHQ status: the relative prevalence of cases was higher in each category of perceived amount of change ('none' = 17.2%; 'little' = 19.9%; 'moderate' = 24.1%; 'quite a lot' = 30.4%; 'a great deal' = 30.7%; chi-square = 52.596; $p<0.00$; d.f.=4); and there was a higher mean number of changes among those who were classed as cases (mean = 2.85 changes (s.d.= 2.34), compared to mean = 2.57 changes (s.d. = 2.32) among non-cases; $t=-3.437$; $p<0.00$; d.f =4351).

Effects of workplace change on employee health

Logistic regression analysis was used to investigate further the associations between predictor factors and GHQ status in 2003. Following Mak and Mueller (2000), related variables were grouped into blocks and entered into the model in the following order:

> **Block 1** – GHQ 'caseness' in 2002. To control for the strong association between past and current health (Stansfeld et. al., 1998).
> **Block 2** – Personal and biographic factors. Trait, demographic and state variables were measured in 2002. Other variables, such as life events which reflected aspects of life over the previous year, and WLB, were measured in 2003.
> **Block 3** – Objective workplace and job characteristics, and perceived demands, control and support (DCS model) in 2002.
> **Block 4** – Measures of organisational change (change factors, types of change; quantity of change) in 2003.

The full results can be seen in Table 4. As large sample sizes can make the statistical significance tests overly sensitive (Hair et al, 1995), only those estimates which were significant at the 99% level ($p<0.01$) as a minimum are reported as significant – these

are recorded in bold in the table. The odds ratios reported were derived from the simultaneous consideration of **all** the independent variables; the changes in model deviance values and the Nagelkerke (pseudo) R^2 figures represent a measure of the contribution of each block of variables to explaining differences in the relative likelihood of GHQ caseness (see Mak and Mueller 2000, p. 320-322 for a similar approach).

* Table 4 about here*

Each block of variables made a significant contribution to the model. As expected, GHQ status at 2002 (block 1) was a strong predictor of GHQ in 2003. In terms of the personal and non-work variables (block 2), dispositional neuroticism was also associated with a propensity to score more negatively on GHQ (Hardy et. al., 2003). In line with Rosenberg's (1962) research into anxiety, higher self-esteem was related to a lower relative odds of caseness. Having two children, as opposed to having none, had a protective health effect. Those respondents who reported poorer WLB (i.e. increased conflict) were markedly more likely to be classed as cases. The other significant non-work factor was the number of life events experienced in the preceding year: the relative likelihood of caseness increased by over 50% for those who had experienced one life event, and more than doubled for those who had experience of two or more events. Only two workplace measures (block 3) showed positive significant relationships with GHQ status. Firstly, one of the variables in the DCS model, perceived autonomy and control, showed a positive association with wellbeing. In addition to this, perhaps surprisingly, increasing overtime was associated with a decreasing relative likelihood of caseness. Taken together with the

finding on WLB, it may be that working overtime has positive effects (such as additional income) for an individual, but longer hours which lead to disruption of home and/or family life have a negative effect on employee mental health.

As the change in deviance and pseudo-R^2 figures show, even after controlling for a comprehensive range of personal, demographic, lifestyle, objective and psychosocial work variables, the organisational change variables (block 4) added a significant contribution to the model. None of the individual *items* of organisational change was significant at the 99% significance level. However, some of the change *factors* did show significant associations. Respondents who reported an increase in the amount of work (work content factor) over the previous year were more likely to be classed as GHQ cases. On the other hand, increased training and promotion and improved job security both had a beneficial effect on employee health. Amount of change appeared to show a somewhat ambiguous relationship with GHQ status: greater perceived change was associated with poorer health, but the additive score of number of changes showed a small positive effect. We revisit the implication of the discrepancy between subjective views and objective measures in our discussion.

Only one aspect of communication – the rating of managers' effectiveness in informing employees – was significantly associated with GHQ caseness: decreasing effectiveness was associated with a higher likelihood of caseness. Neither channels of communication nor extent of consultation appeared to affect employee health. Respondents in one Trust were asked about the change process during in-depth interviews. Their comments shed some light on the survey findings. While in theory a desirable part of the change process, consultation was often perceived as ineffective,

tokenistic or absent. Nevertheless, respondents' accounts clearly showed the importance they attached to being informed about the nature of changes, especially how and when they would occur. A clear message was that they only wanted to be informed of changes that were relevant to them and the likely consequences for their work and/or home lives.

DISCUSSION

In this final section, we consider some practical and theoretical implications arising from our findings. We fully acknowledge the limitations of our research, not least the modest response rate. We also recognise that there are dangers in assuming generalisability of findings from NHS employees to other employees: even among large employing organisations the NHS is distinctive in terms of its financing, centralised control and the professional character of the workforce (Bach, 2004. p. 7). Nevertheless, we consider that our study findings have the potential to contribute to the 'deeper' approach to understanding change processes within the public sector, as advocated by Ferlie et. al. (2003).

All employers in the UK are under a legal obligation to prevent and control factors leading to stress in their workforce. Our findings support the consistently demonstrated association that hospital employees have higher rates of potential psychiatric illness compared to the general working population (Tennant, 2001). This concern extends beyond mental health and wellbeing: findings from the Whitehall II Study have linked psychological distress to a subsequent higher risk of coronary heart disease, especially amongst men (Stansfeld et al., 2002). In terms of consequences

for employing organisations and the wider society, population studies have demonstrated the connection between mental health problems and higher sickness absence from work (Almond and Healy, 2003), with Hardy et. al. (2003) suggesting that the nature of the link is causal.

We have shown that, within the NHS, certain aspects of workplace change are related to mental health. Much research has focused on negative aspects of change for employees (e.g. Eriksson, 2004). Papers in a recent special edition of this journal (2003, 14, 1) also highlighted difficulties and limitations of change across the public sector more generally. However, we challenge the often-held assumption that change will necessarily have an adverse effect on health. Our findings indicate areas, such as promotion and development, where a positive impact can be anticipated. Within the NHS, the Improving Working Lives Standard (http://www.dh.gov.uk/PolicyAndGuidance/HumanResourcesAndTraining/ModelEmployer/ImprovingWorkingLives/fs/en) offers an opportunity for a focus on development.

We also found that changes in job security had a direct effect on mental health. Job insecurity is not only related to actual and threatened NHS job cuts, but also to the wider and longer-term debates over privatisation of parts of the health service. Prospects of changing employers and terms and conditions of employment are also

In relation to communication, the National Staff Survey could be used to assess employee perceptions of the effectiveness of change interventions and the communication of change and provide evidence for remedial action at the local level.

Although our focus was on one employer, there is reason to believe that the positive aspects of change may be replicated in other employment contexts. For example, in their study of employees in metal industry and retail trade in Finland, Tuomi et. al. (2004) found that opportunities for development were positively associated with mental wellbeing. We suggest the extension of our investigation to other employing sectors and contexts.

A strength of our study was its comprehensiveness: we controlled for a very wide range of potential confounders that, to our knowledge, have not previously been brought together in the same study. In line with other workplace studies (e.g. Evans and Huxley 2002; Sagie and Krasz, 2003), we found that subjective workplace factors have greater impact than objective factors on employee health. In relation to change we showed that perceptions of the types and amount of change are more powerful than objective indicators in predicting effects on employee mental health.

Bordia et al (2004) have suggested that the negative impact of organisational change on psychological health arises because of uncertainty, which is related to control. Their findings offer some insight into our own results, in that changed job security has an obvious link to uncertainty. They also found that "timely, credible and trustworthy" communication (p.514) reduced uncertainty. Our findings suggest that training and promotion may reduce uncertainty by increasing control. Further research, building upon our study and its findings, which investigates further the nature of the relationship between change and control, would be useful.

As our list of references will attest, much of the research on employee health and wellbeing has been from the 'health' perspective, with less emphasis from the academic community in business and management. The practitioner management community strongly advocates the business benefits of focusing on employee wellbeing (Tehrani et. al., 2007). A further contribution of our study is to bring the health and employment research agendas closer together.

Given the contemporary concern over workplace stress and managing wellbeing, the ever-present focus on workplace and organisational change, and the 'holy grail' quest (Boselie et. al., 2005) to demonstrate links between human resource management and individual and organisational performance, fuller attention to the mental health of employees may help facilitate successful change outcomes for employing organisations *and* their staff.

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Table 1: Factor analysis (principal components analysis) of changes to job

	Factor loadings				
	Training & development	**Work content**	**Peer contact**	**Patient contact**	**Job security**
(vii) Opportunities for training	0.78				
(viii) Amount of training	0.76				
(ix) Promotion opportunity	0.64				
(x) Support etc from management	0.65				
(i) Amount of work		0.74			
(v) Administrative aspects of workload		0.71			
(ii) Variety of tasks involved in job		0.58			
(vi) Contact with computing technology		0.43			
(xii) Number of people worked with day-to-day			0.67		
(xi) Contact with union			0.63		
(iii) Amount of contact with patients				0.85	
(iv) Quality of contact with patients				0.69	
(xiii) Job security					Did not load on any factor

Table 2: Composition of sample by staff group, 2002 and 2003

Staff group	**2002**		**2003**	
	N	**%**	**N**	**%**
Nurses – D-grade and above	2130	39.6	1697	40.2
Administrative & Clerical; Managers	900	16.7	728	17.2
Professions Allied to Medicine; Scientific & Theraputic	707	13.1	585	13.9
Medical	618	11.5	498	11.8
Nurses – A-C grades; Ancillary; Maintenance	579	10.8	352	8.3
Professional & Technical	451	8.4	362	8.6
Total	5385	100.0	4222	100.0

Table 3: Effects of job changes over the previous 12 months on GHQ status (significant findings only)

	Overall N (%) indicating change	GHQ case N (%) indicating change	Non-GHQ case N (%) indicating change	Significance (p value)
The quality of my physical surroundings changed	1276 (29.0)	356 (33.1)	908 (27.7)	0.00
My unit or department underwent reorganisation	777 (17.7)	244 (22.7)	530 (16.2)	0.00
The way that my pay is decided changed	640 (14.5)	181 (16.8)	455 (13.9)	0.02
I chose to move to a new work location (e.g. ward, department, unit or hospital)	631 (14.3)	132 (12.3)	490 (15.0)	0.03
Management instructed me to move to a new work location (e.g. ward, department, unit or hospital)	605 (13.7)	189 (17.5)	410 (12.5)	0.00
I applied for promotion and was successful	567 (12.9)	115 (10.7)	446 (13.6)	0.01
I applied for promotion and was not successful	270 (6.1)	87 (8.1)	181 (5.5)	0.00
Management instructed me to change my shifts or days of work	238 (5.4)	83 (7.7)	154 (4.7)	0.00
Management decreased the number of hours I work in this job	55 (1.2)	7 (0.6)	47 (1.4)	0.04
My unit or department was closed	47 (1.1)	20 (1.9)	27 (0.8)	0.00

Table 4: Logistic regression model predicting GHQ 'caseness' at 2003

Dependent variable	**GHQ 2003**	
	Odds ratio - OR (99% confidence intervals)	**Significance p values**
Block 1: GHQ 2002	2.33 (1.79-3.04)	0.00
Block 2: Personal and demographic variables		
Neuroticism	1.39 (1.06-1.82)	0.00
Self esteem	0.96 (0.93-0.99)	0.00
Children (ref cat = none) ~ one ~ two ~ three or more	1.00 0.73 (0.50-1.05) 0.68 (0.48-0.95) 0.94 (0.61-1.44)	 0.03 0.00 0.69
Life events (ref cat = none) ~ one ~ two or more	1.00 1.54 (1.16-2.05) 2.09 (1.56-2.78)	 0.00 0.00
Work-life conflict (WLB)	2.09 (1.75-2.49)	0.00
Extroversion; Self efficacy; Age; Gender; Marital status; Educational qualifications; Housing tenure; Income; Car ownership; Social support; Alcohol consumption; Smoking status		All n.s. at p<0.01
Block 3: Work variables 2002		
Overtime (ref cat = none) ~ low ~ med ~ high	1.00 0.88 (0.64-1.22) 0.69 (0.50-0.95) 0.67 (0.46-0.98)	 0.32 0.00 0.01
Autonomy/control	0.81 (0.63-0.99)	0.00
Cohort; Trust; Staff group; Job tenure; Full-time/part-time; Work demands; Support from colleagues; support from managers		All n.s. at p<0.01
Block 4: Organisational change		
Perceived amount of overall change	1.21 (1.06-1.38)	0.00
Number of changes	0.89 (0.81-0.99)	0.01
Increasing training and development	0.66 (0.55-0.79)	0.00
Increasing job content	1.20 (1.01-1.39)	0.01
Increasing job security	0.83 (0.67-0.99)	0.01
Decreasing managerial effectiveness in communicating change	1.16 (1.01-1.34)	0.01
Way pay is decided changed; Management decreased number of hours; Management instructed change of shifts; Chose to move to a new work location; Management instructed move to new location; My unit or department was closed; Unit or department underwent reorganisation; Applied for promotion, was successful; Applied for promotion, was unsuccessful; Quality of physical surroundings changed; Peer contact changed; Patient contact changed; Channels of communication; Extent of communication		All n.s. at p<0.01
Change in model deviance (-2 log likelihood)/Nagelkerke (pseudo) R^2		
~ Block 1	3869.87/0.114	0.00
~ Adding Block 2	- 386.48/0.249	0.00
~ Adding Block 3	-73.94/0.273	0.00
~ Adding Block 4	-153.32/0.322	0.00
N in model	3699	

Appendix: Measures of workplace change developed for the survey questionnaire

1. Thinking back over the past 12 months, how have the following aspects of your job changed?

	Increased a lot	Increased a little	Stayed the same	Decreased a little	Decreased a lot	Not relevant to my job
(i) The amount of work I do	5	4	3	2	1	☐
(ii) The variety of tasks involved in my job	5	4	3	2	1	☐
(iii) Amount of contact with patients	5	4	3	2	1	☐
(iv) Quality of contact with patients	5	4	3	2	1	☐
(v) Administrative aspects of my workload	5	4	3	2	1	☐
(vi) Contact with & use of computing technology	5	4	3	2	1	☐
(vii) Opportunities for training	5	4	3	2	1	☐
(viii) The amount of training I have received	5	4	3	2	1	☐
(ix) Opportunities for promotion	5	4	3	2	1	☐
(x) Amount of support, supervision or consultation with senior staff or management	5	4	3	2	1	☐
(xi) Contact with my union or staff association	5	4	3	2	1	☐
(xii) The number of people I work with on a day-to-day basis	5	4	3	2	1	☐
(xiii) The security of my job	5	4	3	2	1	☐

2. Please also consider whether the following aspects of your job or working conditions have changed over the past 12 months.

	Changed during the past 12 months?	
	Yes	**No**
My contract changed from NHS to private sector (e.g. facilities management company)	1	0
My contract changed from private sector (e.g. facilities management company) to NHS	1	0
I moved from a national or Whitley contract to a Trust or local contract (local terms and conditions)	1	0
I moved from a local contract to a national or Whitley contract (harmonisation of terms and conditions)	1	0
The way that my pay is decided changed	1	0
I chose to increase the number of hours I work in this job	1	0
Management increased the number of hours I work in this job	1	0
I chose to decrease the number of hours I work in this job	1	0
Management decreased the number of hours I work in this job	1	0
I chose to change my shifts or days of work	1	0
Management instructed me to change my shifts or days of work	1	0
I chose to move to a new work location (e.g. ward, department, unit or hospital)	1	0
Management instructed me to move to a new work location (e.g. ward, department, unit or hospital)	1	0
My unit or department has expanded	1	0
My unit or department was downsized	1	0
My unit or department was closed	1	0
My unit or department underwent reorganisation	1	0
I applied for promotion and was successful	1	0
I applied for promotion and was not successful	1	0
My line manager or supervisor changed	1	0
I now work with different colleagues	1	0
The quality of my physical surroundings changed	1	0
My access to equipment changed	1	0